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09/836,351	04/18/2001	Jang-Jin Yoo	8733,421.00	8728

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EXAMINER

RUDE, TIMOTHY L

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 12/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/836,351

Applicant(s)

YOO ET AL.

Examiner

Timothy L. Rude

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 3,6-11,14,15,17-36 and 38-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,12,13,16 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Claims***

1. Claims 1 and 37 are amended.

### ***Claim Objections***

2. The objection to claim 37 is withdrawn.

### ***Double Patenting***

3. Claims 1, 2, 4, and 5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of copending Application No. 09/758,566. Although the conflicting claims are not identical, they are not patentably distinct from each other because they pertain to the use of dielectric structures to improve viewing angle.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (Watanabe) USPAT 6,259,503 B1.

As to claim 1, Watanabe discloses in the first embodiment (col. 5, line 51 through col. 8, line 5 and Figures 11, 12, and 16), an IPS-LCD device, comprising: first, 101, and second, 201, substrates opposing each other; a scanning (Applicant's gate) line, 108, on the first substrate; a signal (Applicant's data) line, 102, perpendicular to the gate line; a thin film transistor, 109, at a crossing portion between the gate and data lines; a

common electrode (portion running left to right in Figure 11, Applicant's common line), 103, parallel to the gate line; a plurality of common electrodes (portions running top to bottom in Figure 11), 103, electrically connected to the common line, wherein the common electrodes are spaced apart from each other; a plurality of pixel electrodes, 104, alternately arranged with the plurality of common electrodes, wherein each pixel electrode is spaced apart from an adjacent common electrode; a plurality of insulator films, 105 and 106 (wherein 105 above common electrodes 103 is Applicant's gate-insulating layer and 106 above data line 102 is Applicant's passivation layer) (wherein 106 above the center common electrode of multiple pixels are Applicant's dielectric protrusions), between the first and second substrates; and a liquid crystal layer, 301, between the first and second substrates, wherein the liquid crystal layer and the dielectric protrusion have different dielectric constants as evidenced by Figure 16 and Table 2 (col. 7, lines 31-42).

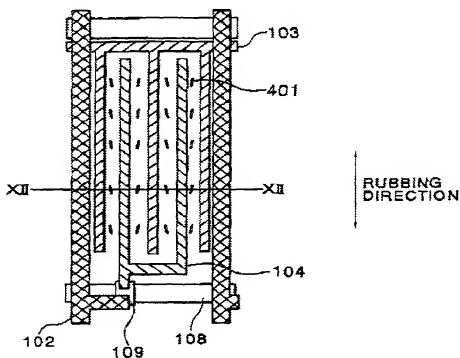
Please note that the insulating films (106 above the center common electrode of multiple pixels) do protrude into the liquid crystal material per Watanabe, Figure 12, and they do distort the electric field per Figure 16.

Please note that making integral and making separable are modifications considered to require only routine skill in the art. It is respectfully pointed out that, although Applicant has not claimed discrete dielectric protrusions that are not patterned from Applicant's gate-insulating layer and/or Applicant's passivation layer, and Applicant has not claimed a plurality of dielectric protrusions per pixel, a modification of the present claim language to further limit the dielectric protrusions to be comprised of

material other than Applicant's gate-insulating layer and/or Applicant's passivation layer might be considered merely making duplicate parts and making separable (separate or discrete) parts, and would still be considered obvious in view of Watanabe.

Although Watanabe discloses structure with different nomenclature, Examiner considers Applicant's structure as broadly claimed would have been obvious to those of ordinary skill in the art of liquid crystals at the time the claimed invention was made given Watanabe. Applicant might have other dielectric protrusion structural or placement/arrangement disclosures in the specification of the instant Application that might not be considered obvious in view of Watanabe.

**FIG. 11**





As to claim 2, Watanabe discloses the dielectric protrusion has a smaller dielectric constant than the liquid crystal layer in Table 2 (smaller than major axis, col. 7, lines 31-42).

5. Claims 4-5 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Kurihara et al (Kurihara) USPAT 6,335,780 B1.

As to claims 4 and 5, Watanabe discloses the device of claim 1.

Watanabe does not explicitly disclose dielectric protrusions made of an organic material, and more specifically, Watanabe does not explicitly disclose dielectric protrusions made of a photoresist (photoresist is an organic material, examples given in Kurihara col. 1, lines 44-45).

Kurihara teaches the use of photosensitive resin (a dielectric) to produce protrusion structures (col. 8, lines 10-16) to achieve axially symmetrically aligned liquid crystal molecules (Abstract) that improve viewing angle performance of the display.

Kurihara is evidence that those of ordinary skill in the art at the time the claimed invention was made would consider the use of a photoresist, which is an organic material and a dielectric, to be suitable for the intended purpose of forming dielectric protrusions in a liquid crystal display. Kurihara is also evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use an



organic photoresist to produce protrusion structures that achieve axially symmetrically aligned liquid crystal molecules for improved viewing angle performance of said display.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Wantanabe with the dielectric protrusions of organic photoresist to produce protrusion structures that achieve axially symmetrically aligned liquid crystal molecules for improved viewing angle performance of a liquid crystal display.

As to claim 37, Wantanabe discloses the device of claim 1 wherein dielectric protrusions are disposed on the pixel electrodes and common electrodes (Applicant's lines).

Wantanabe does not explicitly disclose dielectric protrusions in an alternating pattern.

Kurihara teaches the use of protrusions in a grid pattern and in a checkered pattern (col. 2, lines 16-20) (Applicant's alternating pattern) to achieve axially symmetrically aligned liquid crystal molecules for improved viewing angle performance of said display (Abstract).

Kurihara is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use an alternating pattern to achieve axially symmetrically aligned liquid crystal molecules for improved viewing angle performance of said display.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Wantanabe with the alternating pattern of Kurihara to achieve axially symmetrically aligned liquid crystal molecules for improved viewing angle performance of said display.

6. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Kawano et al (Kawano) USPAT 6,337,726 B1.

As to claims 12 and 13, Wantanabe discloses the device of claim 1.

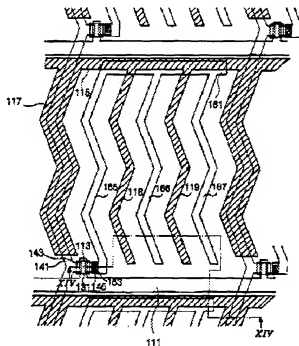
Wantanabe does not explicitly disclose pixel electrodes of ITO or ZTO, and Wantanabe does not explicitly disclose a common electrode of Cr, Al, Mo, Ta, W, Sb or alloys thereof.

Kawano teaches the use of Al for pixel electrodes and opposite electrodes (Applicant's common electrodes) (col. 15, lines 38-44) in an in-plane switched (IPS) LCD that may optionally be made of ITO.

Kawano is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use ITO and/or Al in an IPS LCD as art recognized materials suitable for the purpose of forming pixel electrodes and common electrodes to control the display pixels.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Wantanabe with

the ITO and/or Al materials of Kawano as suitable for the purpose of forming pixel electrodes and common electrodes (MPEP 2144.07) to control the display pixels.



**FIG. 12B**

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Lee et al (Lee) USPAT 6,476,900 B1.

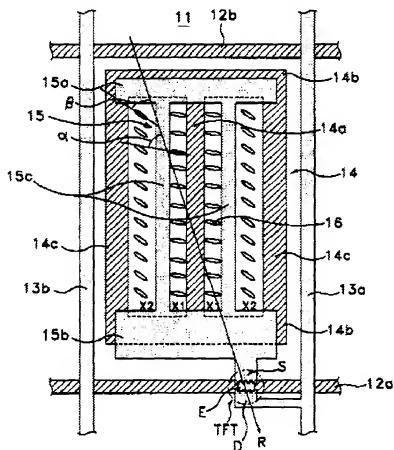
As to claim 16, Wantanabe discloses the display of claim 1.

Wantanabe does not explicitly disclose the use of liquid crystal with negative dielectric anisotropy wherein the molecules would line up parallel to the IPS LCD electrodes when said electrodes are electrically on.

Lee teaches in Figure 2 an IPS LCD with negative or positive dielectric anisotropy (col. 2, lines 25-26), and Lee teaches the rubbing direction is changed to be

compatible with the anisotropic characteristics of the liquid crystal material (col. 3, lines 47-65) to achieve proper switching of the liquid crystal material. Note that some of the angles are improperly expressed, however, one of ordinary skill in the art of liquid crystals would understand that the LC molecules of negative dielectric anisotropy are aligned substantially perpendicular to the electrodes in the off state.

FIG.2



Lee is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use negative dielectric anisotropy and proper alignments to comprise an IPS LCD with satisfactory switching characteristics and reduced color shift (Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Wantanabe with the negative dielectric anisotropy and proper alignments of Lee to comprise an IPS LCD with satisfactory switching characteristics and reduced color shift.

### ***Response to Arguments***

8. Applicant's arguments filed on 20 August 2003 have been fully considered but they are not persuasive.

#### Applicant's ONLY arguments are as follows:

(1) Regarding claims 1 and 2, Insulating layers 105, 106 of Watanabe are not equivalent to Applicant's plurality of dielectric protrusions.

(2) Regarding claims 4, 5, and 37, the prior art does not disclose all the features for at least the reasons noted in (1) above.

#### Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that insulating layers 105, 106 are dielectric materials that do distort the electric field and therefore have a dielectric constant not

equal to that of the liquid crystal layer, and they protrude into said liquid crystal layer in a plurality of locations. Also, despite the nomenclature of Watanabe, they also function as Applicant's gate-insulating layer and Applicant's passivation layer per rejections above. Any inequalities of 105, 106 of Watanabe and Applicant's dielectric protrusions are not apparent from the present claim language.

(2) It is respectfully pointed out that Applicant's arguments noted in (1) above are not persuasive per response above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

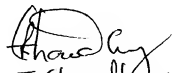
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



TLR  
November 18, 2003

Timothy L Rude  
Examiner  
Art Unit 2871



T. Chaudhary  
Primary Examiner